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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,007	02/10/2006	Young-Ho Jeong	CU-4683 WWP	5805
26530 7590 05/13/2010				
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224 SOUTH MICHIGAN AVENUE				
SUITE 1600				
CHICAGO, IL 60604				
EXAMINER				
AHN, SUNG S				
ART UNIT		PAPER NUMBER		
2611				
MAIL DATE		DELIVERY MODE		
05/13/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/568,007

Applicant(s)

JEONG ET AL.

Examiner

SUNG AHN

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-16, 20, 21 is/are rejected.
7) ☐ Claim(s) 17, 18, 19 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 10 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB-06)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 4 is objected to because of the following informalities: The word "media streams" need to be change to "media stream" in line 7. Appropriate correction is required.
2. Claim 4 is objected to because of the following informalities: The word "a packet" need to be change to "the packet" in line 16. Appropriate correction is required.
3. Claim 6 is objected to because of the following informalities: The word "an RS encoder" need to be change to "a RS encoder" in line 29. Appropriate correction is required.
4. Claim 6 is objected to because of the following informalities: The word "an RS encoder" need to be change to "the RS encoder" in line 30. Appropriate correction is required.
5. Claim 11 is objected to because of the following informalities: The word "a media stream" need to be change to "the media stream" in lines 3, 6, and 8 of page 21. Appropriate correction is required.
6. Claim 13 is objected to because of the following informalities: The word "from the steps a) to e) and b1) and the OD/BIFS media stream" need to be change to "from the steps a) and b1)" in line26. Appropriate correction is required.
7. Claim 14 is objected to because of the following informalities: The word "a packet" need to be change to "the packet" in line 33. Appropriate correction is required.

8. Claim 15 is objected to because of the following informalities: The word "an RS" need to be change to "the RS" in line 11. Appropriate correction is required.
9. Claim 17 is objected to because of the following informalities: The word "a sub-channel" need to be change to "the sub-channel" in line 34. Appropriate correction is required.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 2, 10, and 20 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
12. Claim 2 recites the limitation "data stream" in line 23. The "a data stream" is already produced from error correction encoding mean recited in claim 1 thus not clear whether data stream is produced by preprocessing or error correction encoding means.
13. Claims 10 and 20 recite the limitation "and/or". The claim language "and/or" makes claim limitation indefinite.
14. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat.

App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 10 and 20 recites the broad recitation of apparatus and method where does not include error correction encoding means and/or interleaving means which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 1, 2, 4-8, 10, 11, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. PGPub. No. 20020080887 to Jeong et al. in further view of WIPO Pub. No. WO 02/058388 to Ahn et al.

As to **Claims 1 and 11**, Jeong disclose a digital multimedia broadcasting (DMB) system, comprising:

an encoding means for encoding an audio signal (Fig. 1 (11-14));

a multiplexing means for multiplexing the media stream (Fig. 1 (15), Fig. 6, paragraph [0051], where the encoded audio and data is multiplexed to MPEG-2 transport stream to be transmitted through modulation part);

an error correction encoding means for performing additional error correction encoding on the media stream outputted from the multiplexing means (Fig. 1 (30), paragraph [0053, 0056], where the Reed-Solomon (RS) encoder for error correction);

an interleaving means for removing temporal correlation between adjacent byte units within a data stream outputted from the error correction encoding means (Fig. 1 (40), Fig. 7, paragraph [0053, 0061], where the outer interleaver performing byte-wise interleaving);

and a transmitting means for transmitting a DMB media stream outputted from the interleaving means (Fig. 1 (120, 130, 140), paragraph [0051], where the MPEG-2 transport stream is modulated and transmitted)

Jeong disclose the transmission of encoded audio and data in MPEG-2 transport stream with added error correcting coding and interleaving (Fig. 1, paragraph [0051, 0053, 0061]) but does not explicitly disclose of the digital media broadcasting of synchronized video and the interactive service objectifying data through synchronizing mean.

Meanwhile Ahn disclose the transmission of MPEG-4 synchronized with MPEG-2 data by synchronizing (packetizing) the audio and video data along with object information such as object descriptor (OD) and binary format for scene (BIFS) through sync layer (SL) packetizer (Fig. 1 (131)) (Fig. 1, Page 1 line 25—Page 2 line 14, Page 7 line 31 – Page 8 line 3). Also the communication of interactive audio-visual scenes (data object for interactive service) is one of standard service supported along with video/audio for MPEG-4 format as described in ISO/IEC 14496-1 International Standard (Fig. 1, Section 0.6.2 on pages 10-11) and IEEE Journal "Virtual Shop and Virtual Meeting Point - Two Prototype Application of Interactive Services Using the New Multimedia Coding Standard MPEG-4" (abstract) presented here as evidential reference.

Therefore, one of ordinarily skilled in the art would have found obvious from the combined teachings of Jeong and Ahn as a whole to produce the invention as claimed on expectation providing both MPEG-2 and MPEG-4 data for broadcasting and communication seamlessly by synchronizing newly proposed MPEG-4 format to existing MPEG-2 communication scheme (Ahn – Page 1 lines 13-23).

As to **Claim 21**, Jeong disclose a digital multimedia broadcasting (DMB) system, comprising:

encoding audio data at a high efficiency for data compression (Fig. 1 (11-14));

multiplexing a media stream (Fig. 1 (15), Fig. 6, paragraph [0051], where the encoded audio and data is multiplexed to MPEG-2 transport stream to be transmitted through modulation part);

encoding and interleaving for correcting an error to be occurred in a media stream multiplexed (Fig. 1 (30, 40), paragraph [0053, 0056, 0061], where the Reed-Solomon (RS) encoder for error correction and the outer interleaver performing byte-wise interleaving);

transmitting a stream interleaved (Fig. 1 (120, 130, 140), paragraph [0051], where the MPEG-2 transport stream is modulated and transmitted)

Jeong disclose the transmission of encoded audio and data in MPEG-2 transport stream with added error correcting coding and interleaving (Fig. 1, paragraph [0051, 0053, 0061]) but does not explicitly disclose of the digital media broadcasting of synchronized video and the interactive service objectifying data through synchronizing mean.

Meanwhile Ahn disclose the transmission of MPEG-4 synchronized with MPEG-2 data by synchronizing (packetizing) the audio and video data along with object information such as object descriptor (OD) and binary format for scene (BIFS) through sync layer (SL) packetizer (Fig. 1 (131)) (Fig. 1, Page 1 line 25—Page 2 line 14, Page 7 line 31 – Page 8 line 3). Also the communication of interactive audio-visual scenes (data object for interactive service) is one of standard service supported along with video/audio for MPEG-4 format as described in ISO/IEC 14496-1 International Standard (Fig. 1, Section 0.6.2 on

pages 10-11) and IEEE Journal "Virtual Shop and Virtual Meeting Point - Two Prototype Application of Interactive Services Using the New Multimedia Coding Standard MPEG-4" (abstract) presented here as evidential reference.

Therefore, one of ordinarily skilled in the art would have found obvious from the combined teachings of Jeong and Ahn as a whole to produce the invention as claimed on expectation providing both MPEG-2 and MPEG-4 data for broadcasting and communication seamlessly by synchronizing newly proposed MPEG-4 format to existing MPEG-2 communication scheme (Ahn – Page 1 lines 13-23)

Jeong in view of Ahn disclose the digital multimedia broadcasting (DMB) system wherein encoded, synchronized, and error corrected audio/video signal is transmitted in predetermined format (MPEG-2, MPEG-4, etc) as described above but does not explicitly disclose the computer-readable recording medium for recording program that implement DMB method above.

Meanwhile examiner takes Official Notice that function executed with executable instructions recorded in computer hardware is well known in art because it allows flexibility over dedicated hardware. Therefore, it would have been obvious to the person of ordinary skill in art at time of invention was made to execute functions through a processing device with recorded instruction to increase the flexibility of the apparatus.

As to **Claim 2**, Jeong in view of Ahn further disclose the digital multimedia broadcasting (DMB) system wherein the audio/video signal is encoded and transmitted in predetermined format (MPEG-2, MPEG-4, etc) but does not explicitly disclose converting audio/video signal to predetermined format by preprocessing before encoding. Meanwhile it is well known in art that raw video/audio source (analog) is converted to frame of data of certain format (digital) before encoded through use of digital camcorders, digital cameras, etc. The generation of video frame from standard source before encoding is shown in Fig. 1 and Col. 1 lines 28-37 of U.S. Pat. No. 6570926 presented here as evidential reference.

As to **Claims 4 and 13**, Ahn further disclose the digital multimedia broadcasting (DMB) system wherein the synchronizing means include:

an Object Descriptor (OD)/Binary Format for Scene (BIFS) generating means for generating OD/BIFS for interactive service (Fig. 1 (121), Page 7 line 31 – Page 8 line 3, where the object separator extract the object descriptor (OD) and binary format for scene (BIFS) and send to sync layer packetizer along with audio and video for generating synchronized packet stream);

an Initial Object Descriptor (IOD) generating means for generating an IOD (Fig. 1 (121), Page 7 line 31 – Page 8 line 3, where the object separator extract the initial object descriptor (IOD) to be used in PSI);

a sync layer packetizing means for synchronizing media streams outputted from the encoding means and the OD/BIFS generating means (Fig. 1 (131), Page 7 line 31 – Page 8 line 3, where the sync layer packetizer packetizes the audio and video along with OD and BIFS for generating synchronized packet stream);

The suggestion/motivation is the same as that used in the rejection for claims 1 and 11.

As to **Claims 5 and 14**, Ahn further disclose the digital multimedia broadcasting (DMB) system wherein the multiplexing means includes:

a PES packetizing means for generating a Program Elementary Stream (PES) based on a packet outputted from the sync layer packetizing means (Fig. 1 (136));

a section packetizing means for generating a predetermined section based on a packet outputted from the sync layer packetizing means (Fig. 1 (135));

a Program Service Information (PSI) generating means for generating PSI based on data outputted from the IOD generating means (Fig. 1 (134), Page 7 line 31 – Page 8 line 3, where the PSI generator generating PSI using IOD from object separator);

a transport stream (TS) packetizing means for packetizing data outputted from the PES packetizing means, the section packetizing means and the PSI generating means into transport stream (Fig. 1 (137))

The suggestion/motivation is the same as that used in the rejection for claims 1 and 11.

As to **Claims 6 and 15**, Jeong further disclose the digital multimedia broadcasting (DMB) system wherein the error correction encoding means is utilized to satisfy the target bit error rate (BER) performance of multimedia data, and the error correction encoding means uses an RS encoder and has structure of an RS encoder (204,188, t=8) substantially (Fig. 6, paragraph [0056], where the shortened RS code (204, 188, t=8) is used for correcting errors to enhance the bit error rate (inherent function of RS encoder)).

As to **Claims 7 and 16**, Jeong further disclose the digital multimedia broadcasting (DMB) system wherein the interleaving means is formed of 12 branches, and each branch, where is formed of memories based on a 17-byte x N unit (N=0,1,2, ..., 11), has input and output switches synchronized with each other, and a synchronizing word for synchronization is transmitted always through a '0' branch and the synchronization of a deinterleaver is obtained by allocating the first recognized synchronization word to the '0' branch (Fig. 7,

paragraph [0061], where the interleaver composed of 12 branches with 17-byte x N shift registers (memory) and sync byte always be routed through branch '0').

As to **Claim 8**, Jeong in view of Ahn further disclose the digital multimedia broadcasting (DMB) system wherein the transmitting means utilizes a digital audio broadcasting system (DAB), a digital television (TV) broadcasting system, a digital satellite broadcasting system, and digital cable broadcasting system (Ahn – Page 1 lines 13-23, where the digital broadcasting of audio, video, and data is disclosed but does not disclose the broadcasting in digital satellite and cable system. Meanwhile it is well known in art that digital broadcasting of audio, video, and data can apply various systems including satellite and cable as described in Col. 1 lines 14-22 of U.S. Pat. No. 6976265 presented here as evidential reference).

As to **Claim 10**, Jeong in view of Ahn further disclose the digital multimedia broadcasting (DMB) system, which is based on the digital audio broadcasting system (DAB), a digital television (TV) broadcasting system, a digital satellite broadcasting system, does not include the error correction encoding means and/or the interleaving means according to system performance in a high-speed mobile channel environment (Ahn – Page 1 lines 13-23, where the digital broadcasting of audio, video, and data is disclosed but does not disclose the broadcasting in digital satellite and cable system. Meanwhile it is

well known in art that digital broadcasting of audio, video, and data can apply various systems including satellite and cable as described in Col. 1 lines 14-22 of U.S. Pat. No. 6976265 presented here as evidential reference. Also the claim broad the limitation recited in independent claim 1 therefore the system comprise all the limitation cited in claim 10 as described on rejection of claim 1 above).

17. Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. PGPub. No. 20020080887 to Jeong et al. and WIPO Pub. No. WO 02/058388 to Ahn et al. in further view of White Paper "AVC + AAC The Next Generation of Compression" by Harmonic.

As to **Claims 3 and 12**, Jeong in further Ahn disclose the digital multimedia broadcasting (DMB) system with MPEG-4 audio/video data (Ahn – Page 1 lines 26-33) and MPEG-2 audio coding/encoding and decoding (codec) using Advanced Audio Coding (AAC) but does not explicitly disclose of the using other coding/encoding and decoding (codec) format of "MPEG-4 Part 2" or "MPEG4-Part 10 Advanced Video Coding (AVC)" as video encoder and "Advanced Audio Coding (AAC)", "AAC+", or "Bit Sliced Arithmetic" Coding (BSAC)" as audio encoder.

Meanwhile it is well know in art that MPEG-4 supports additional coding/encoding and decoding (codec) format to take full advantage of new standard. Also Harmonic white paper disclose the new standard codec format of MPEG-4 Part 10 or MPEG-4 Advanced Video Coding along with high efficiency

Advanced Audio Coding (AAC) proposed by ITU and ISO to achieve 40-50% gain over MPEG-2 system (Page 2 - 2nd paragraph, Page 3 – 5th and 6th paragraph).

Therefore, one of ordinarily skilled in the art would have found obvious from the combined teachings of Jeong, Ahn, and Harmonic white paper as a whole to produce the invention as claimed with on expectation of improving digital broadcasting system using improved compression of audio/video signal (more data in transmitted signal) using newly proposed standard of coding/encoding and decoding (codec) format of "MPEG-4 Part 10 Advanced Video Coding" along with high efficiency Advanced Audio Coding (AAC).

18. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. PGPub. No. 20020080887 to Jeong et al. and WIPO Pub. No. WO 02/058388 to Ahn et al. in further view of U.S. PGPub. No. 20030185301 to Abrams et al.

As to **Claim 9**, Jeong in further Ahn disclose the digital multimedia broadcasting (DMB) system transmitting the DMB media stream (Jeong – Fig. 1 (120, 130, 140), paragraph [0051]) (Ahn – abstract) but does not explicitly transmitting means cooperated with any one among the DMB system, an ensemble remultiplexer, an Ensemble transport Interface (ETI) adapter, and an Ethernet adapter.

Meanwhile it is well know in art that the digital multimedia stream (DMB) can broadcasted through various transport mediums (over the air, over the wire

(Ethernet cable), etc) with adapter for specific transport medium. Also Abrams disclose the network interface (Ethernet adapter) for communicating compressed digital video data (Fig. 5 (220), paragraph [0027]) and packetizing data streams into packets suitable for the transport medium such as network (paragraph [0077]).

Therefore, one of ordinarily skilled in the art would have found obvious from the combined teachings of Jeong, White, and Abrams as a whole to produce the invention as claimed with an expectation of transmitting digital multimedia stream over various transport medium like Ethernet cable through Ethernet adapter to broadcast to wider range of customers as only limited range is covered for over the air broadcasting.

Allowable Subject Matter

19. Claims 17, 18, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fail to anticipate or render obvious step of establishing priority order based on sub-channel for automatic formation of Service transport Interface (STI)/Ensemble Transport Interface (ETI) frame in the digital broadcasting system and selecting a sub-channel based on established priority order above then

determining possibility of transmission and search for sub-channel that can include remaining space of STI/ETI frame when transmission is not possible. Also minimize the remaining space in STI/ETI frame to be outputted in repeating process.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUNG AHN whose telephone number is (571)270-3706. The examiner can normally be reached on Monday-Friday, 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571)272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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